

CLAIMS

What is claimed is:

- 1           1.       A method for driving a diode, comprising:
- 2       (a)     providing a power supply input voltage upto about three volts;
- 3       (b)     selecting of an amount of current from at least two amounts of current to flow
- 4           through a diode; said selecting of said amount of at least two amounts of current
- 5           based upon a voltage of at least two input values;
- 6       (c)     directing said selected amount of current to flow through said diode; wherein at
- 7           least two current sources operating to produce said at least two amounts of current
- 8           are accommodated with headroom voltage provided by said input voltage to
- 9           operate correctly without being connected to an alternating current coupling
- 10          circuit.
- 1           2.       The method as claimed in claim 1, wherein said method is capable of
- 2           driving a vertical cavity surface emitting laser diode.
- 1           3.       The method as claimed in claim 1, wherein a first current source of said at
- 2           least two current sources produces an amount of current substantially equal to one of said
- 3           at least two amounts of current selected.
- 1           4.       The method as claimed in claim 1, wherein said selecting one of said at
- 2           least two amounts of current is accomplished by a pair of transistors operating as a
- 3           differential switch.

1 <sup>5</sup> Sub 917 A circuit for providing a semiconductor laser drive current, comprising:  
 2 (a) a power supply input voltage upto about three volts;  
 3 (b) a differential switch for selecting an amount of current from at least two amounts  
 4 of current depending upon the voltage of each of at least two inputs; said  
 5 differential switch being formed from a pair of transistors; and  
 6 (c) at least two current sources, said at least two current sources being capable of  
 7 producing said at least two amounts of current by at least one of independent and  
 8 combined operation, wherein a suitable amount of headroom voltage for said at  
 9 least two current sources is obtained by the amount of voltage provided by said  
 10 input voltage less a voltage drop across a device being driven by said selected  
 11 current and a voltage drop across said pairs of transistors during operation of said  
 12 circuit.

1 6. The circuit as claimed in claim 5, wherein said pair of transistors are  
 2 bipolar transistors.

1 7. The circuit as claimed in claim 5, wherein approximately a volt of  
 2 headroom voltage is obtained by the amount of voltage provided by said input voltage  
 3 less a voltage drop across said device being driven by said selected current and a voltage  
 4 drop across said pairs of transistors during operation of said circuit.

- 1 8. A circuit, comprising:
- 2 (a) at least two inputs;
- 3 (b) a first transistor connected to a first input of said at least two inputs;
- 4 (c) a second transistor connected to a second input of said at least two inputs;
- 5 (d) a first current source capable of generating a first amount of current connected to
- 6 said first and second transistors; and
- 7 (a) a second current source capable of generating a second amount of current
- 8 connected to said second transistor, wherein a second amount of current and an
- 9 amount of current substantially equal to a second amount of current less a first
- 10 amount of current is capable of being delivered to a device.

- 1 9. The circuit as claimed in claim 8, wherein a second amount of current is
- 2 delivered to said device when said first input is a higher voltage than said second input.

- 1 10. The circuit as claimed in claim 8, wherein said amount of current
- 2 substantially equal to a second amount of current less a first amount of current is
- 3 delivered to said laser diode when said second input is a higher voltage than said first
- 4 input.

- 1 11. The circuit as claimed in claim 8, wherein said first and second transistors
- 2 are bipolar transistors.

- 1 12. The circuit as claimed in claim 8, wherein said first input is connected to a
- 2 base of said first transistor.

- 1 13. The circuit as claimed in claim 8, wherein said second input is connected
- 2 to a base of said second transistor.

- 1 14. The circuit as claimed in claim 8, wherein said first current source is
- 2 connected to an emitter of each of said first and second transistors.

1 15. The circuit as claimed in claim 8, wherein said second current source is  
2 connected to a collector of said second transistor.

1 16. The circuit as claimed in claim 8, wherein said laser diode is a vertical  
2 cavity surface emitting laser diode, said vertical cavity surface emitting laser diode being  
3 connected to a collector of said second transistor.

1 17. The circuit as claimed in claim 8, wherein said circuit is capable of driving  
2 said laser diode with a voltage supply of three volts or less without alternative current  
3 coupling.

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- 1 18. A circuit for providing a semiconductor laser drive current, comprising:  
2 (a) means for providing a power supply input voltage, said power supply input  
3 voltage upto about three volts;  
4 (b) means for selecting an amount of current from at least two amounts of current to  
5 flow through a diode; said selecting means being capable of analyzing the voltage  
6 of each of at least two inputs;  
7 (c) means for generating said at least two amounts of current; and  
8 (a) means for directing said selected amount of current to flow through said diode;  
9 wherein said generating means is capable of operating correctly without said  
10 circuit being connected with an alternating current coupling circuit.